

Work Order ID 58388

May 5, 2010 12:48:01 PM

Item ID: D407-667-205

Accept

Setup Start

Stop

Revision ID:

Item Name: Crosstube Aft

Start Date: 05/05/2010 Start Qty: 1.00

Required Date: 21/05/2010 Req'd Qty: 1.00

Cust Item ID:

Customer:

Reference:

Approvals:

Process Plan:

Date: 10-5-05

Tooling:

Date:

QC:

Date:

SPC (Y/N):

Date:

Run

Start

Stop

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Draw Number	Draw Rev.	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
Draw Nbr	Revision Nbr								
D407-667-245	Rev F	0.00							
100	DOCUMENT CONTROL	0.00							
DC	Memo								
Document Control	Photocopy bluefile and create labels as per PPP D407-667-205 CHG006								
110	Pick Kit	0.00							
Packaging	Packaging	0.00							
Packaging	Memo								
120	BENDING MACHINE - CROSSTUBES	0.00							
CNC Bend 1	Memo	0.00							
CNC Delta 100 Bender	1-Bend tube as per Dwg D407-667-245 using CNC bender program 407 Aft and Folio FT								

D for CL 10/07/21

8/10/21

IX MB 10-06-24

IX MB 10-06-24

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Customer:

Reference:

Run Start



Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_

Stop



QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Sequence ID/  
Work Center IDOperation  
DescriptionSet Up/  
Run HoursDraw  
NumberDraw  
Rev.Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

130

QC15- Crosstube Dimensional Check

0.00

8/10/06/24



QC

Memo

0.00

Quality Control

90

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QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Run Start



Stop

Sequence ID/  
Work Center IDOperation  
DescriptionSet Up/  
Run HoursDraw  
NumberDraw  
Rev.Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

140

0.00



Crosstubes

Crosstubes

0.00

Memo

1-Drill pilot holes in tube using drill Jig DT8583 &amp; DT8584 as per Dwg D407-667-245. Drill all (3) top holes.

2-Drill and Ream all holes in tube to finish size using drill Jig DT8583 &amp; DT8584 as per Dwg D407-667-245. Check dimensions between holes on all four sides.

3-Flip tube and switch drilling Jigs from right to left, left to right. Locate Jigs off existing holes using "T" pins.

4-Drill pilot holes using drill Jig DT8583 &amp; DT8584 as per Dwg D407-667-245. Drill only the top (2) holes.

5-Drill &amp; ream the top (2) holes to finish size using drill Jig DT8583 &amp; DT8584 as per Dwg D407-667-245

6-Drill Aft rivet holes using drill Jig DT8789 as per Dwg D407-667-245. Note: Aft side has 3x top holes.

7-Drill Fwd rivet holes using drill Jig DT8789 as per Dwg D407-667-245. Drill only the top (3) holes.

8-C'sink holes as per Dwg D407-667-245. Allow rivet to sit below surface to compensate for paint.

9- Scribe tube to identify on the inner chamfer in the cuff D# and B#

10-Deburr &amp; Inspect for surface damage. Repair damage within limits as per

MAP  
10-06-28

- JAW 10-06-28

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QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Setup Start

Stop

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Stop

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Draw Number	Draw Rev.	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
	Dwg D407-667-245								
150	Crosstubes Chemical Conversion	0.00							
	HandFXtube	0.00							
	Hand Finishing Crosstubes								
160	QC3- Inspect Part Finish	0.00							
	QC	0.00							
	Quality Control								
170	QC5- Inspect part completeness to step on W/O	0.00							
	QC	0.00							
	Quality Control								

1 — — *AWN*  
1006-29*8/10/13**8/10/13**Ⓢ*

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Customer:

Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_  
QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Run Start

Stop

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Draw Number	Draw Rev.	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
180  Outsource2 Outsource process - NDT	Outsource process - NDT per QSI038 4.1  <b>Memo</b> Liquid Penetrant Inspection as per QSI 0380 Issue P/O: <u>12200</u> LPI as per ASTM 1417 Level 2 Attach copy of NDT results to work order	0.00  0.00							CZ 10/7/12 ① CZ 10/7/17 ①
190  Packaging Packaging	Packaging  <b>Memo</b> Ensure copy of NDT results attached to work order.	0.00  0.00							P 10/7/12 ① P 10/7/18 ①
200  QC Quality Control	QC5- Inspect part completeness to step on W/O  <b>Memo</b>	0.00  0.00							BT 10-08-13

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Cust Item ID:

Required Date: 21/05/2010 Req'd Qty: 1.00



Customer:

Reference:

Approvals:

Process Plan:

Date:

Tooling:

Date:

Run Start



QC:

Date:

SPC (Y/N):

Date:

Stop



Sequence ID/  
Work Center ID

Operation  
Description

Set Up/  
Run Hours

Draw  
Number

Draw  
Rev.

Plan  
Code

Accept  
Qty

Reject  
Qty

Reject  
Number

Insp.  
Stamp

210

0.00



SprayPaint

0.00

SprayPaint

Memo

1-Prime inside and outside crosstube as per QSI 005 4.2  
2-Paint outside crosstube with White Imron as per QSI 005 4.2

PRIME:

Start Time: 11:00

Fininsh Time: 12:00

PAINT:

Start Time: 3:00

Finish Time: 4:00

ET 10-07-13

220

QC14- Inspect Spray Paint

0.00



QC

Memo

0.00

Quality Control

Then, Wrap in plastic bag to protect from scratches

MA 10 07 14 (1)

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Cust Item ID:

Required Date: 21/05/2010 Req'd Qty: 1.00

Customer:

Reference:

Approvals:

Process Plan:

Date:

Tooling:

Date:

Run

Start



QC:

Date:

SPC (Y/N):

Date:

Stop



Sequence ID/  
Work Center ID

Operation  
Description

Set Up/  
Run Hours

Draw  
Number

Draw  
Rev.

Plan  
Code

Accept  
Qty

Reject  
Qty

Reject  
Number

Insp.  
Stamp

230



Crosstubes

Crosstubes

0.00

Memo

0.00

Crosstubes

1-Install abrasion strips as per QSI 035 using DT8674. Install chafing shield as per Dwg D407-667-245. Note: (3) top holes should be facing up.

2- Lightly scuff the bonded area using a 320 grit sand paper and clean the area with 41058 wash 'n' wipe

3-Install support with magnobond and install clamps as per Dwg D407-667-245 using installation jig DT9025. Torque clamps to 80-100 in lb

A/R Magnobond

Batch:

114158

EXP:

10-08-09

ET 10-07-15

4-Install nut plates as per Dwg D407-667-245. Touch-up rivet heads with Imron paint.

ml 10.07.20

240



QC

QC5- Inspect part completeness to step on W/O

0.00

Quality Control

Memo

0.00

806674

76

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QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Setup Start

Stop

Run Start

Stop

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Draw Number	Draw Rev.	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	----------------	--------------	--------------	---------------	---------------	------------------	----------------

250

Pick Kit

0.00



Packaging

Memo

0.00

Packaging

260

QC4- 100% Inspect kits for completeness

0.00



QC

Memo

0.00

Quality Control

270

Packaging

0.00



Packaging

Memo

0.00

Packaging

Identify and in kanban rack  
Location: \_\_\_\_\_

NUR



Cust Item ID:

Customer:



PC 10/7/21

①

S. Solari

⑦

PC 10/7/21



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Reference:

Approvals:

Process Plan:

Date:

Tooling:

Date:

QC:

Date:

SPC (Y/N):

Date:

Run

Start

Stop

Sequence ID/  
Work Center IDOperation  
DescriptionSet Up/  
Run HoursDraw  
NumberDraw  
Rev.Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

280

QC21- Final Inspection - Work Order Release

0.00



QC

Memo

0.00

Quality Control

10/07/22

R 10-7-21

# Picklist Print

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Page 1

Work Order ID: 58388

Parent Item: D407-667-205

Parent Item Name: Crosstube Aft

Comments: IPP Rev: C 05.09.02 Add holes for compatibility with Bell Skidtubes KJ/JLM  
IPP Rev: D Added Magnobond, Rubber Cushion & Clamps 07-02-19  
JLM

Start Date: 05/05/2010

Required Date: 21/05/2010

Start Qty: 1.00

Required Qty: 1.00

D407-667-205TRN Manufactured No

110 Each

4.0000



Crosstube Turning Detail

## Location

## Loc Qty

## Loc Code

LG

4

57130

1

57131

1

58113

1

58114

1

AN9601D516 MAG1149D25635 Purchased No

230 Each

0.0000

18



Washer

D2856-400

Manufactured No

230 f

302.9400

1.288



Abraison Strip

## Location

## Loc Qty

## Loc Code

ST403

302.94

50593

86.94

56626

216

D2873-043 Manufactured No

230 Each

58.0000

2



Nut Plate Assembly

## Location

## Loc Qty

## Loc Code

LG

58

53966

20

56466

18

57337

20

D-58390 MB 12-06-23

M114742 6/14/21

ml 10-07-20

ml 10-07-20

# Picklist Print

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Page 2

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Comments: IPP Rev:C 05.09.02 Add holes for compatibility with Bell Skidtubes KJ/JLM  
IPP Rev:D Added Magnobond, Rubber Cushion & Clamps 07-02-19  
JLM

Start Date: 05/05/2010

Required Date: 21/05/2010

Start Qty: 1.00

Required Qty: 1.00

D2873-045 Manufactured No 230 Each 54.0000 2  
Nut Plate Assembly

Location	Loc Qty	Loc Code
LG	54	
53967	15	
53968	20	
57336	19	

ml 10-07-20

D2894-1 Manufactured No 230 Each 21.0000 1  
2.750 Support

Location	Loc Qty	Loc Code
LG	21	
43713	5	
43881	16	

RT 10-07-15

D3190-1 Manufactured No 230 Each 20.0000 2  
Chafing Shield

Location	Loc Qty	Loc Code
LG	20	
47456	20	

ml 10-07-20

D3595-063-450 Manufactured No 230 Each 67.0000 2  
RUBBER CUSHION

Location	Loc Qty	Loc Code
LG	67	
53775	39	
58161	28	

RT 10-07-15

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Shop Packet Print

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# Picklist Print

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Work Order ID: 58388

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Comments: IPP Rev:C 05.09.02 Add holes for compatibility with Bell Skidtubes KJ/JLM  
IPP Rev:D Added Magnobond, Rubber Cushion & Clamps 07-02-19  
JLM

Start Date: 05/05/2010

Required Date: 21/05/2010

Start Qty: 1.00

Required Qty: 1.00

MS20601-AD4W8

Purchased

No

230

Each

370.0000

14



RIVET

Location

Loc Qty

Loc Code

ST322

370

108521

98

112203

272

ml 10-07-20

MS21920-22

Purchased

No

230

Each

130.0000

4



Clamp(per MIL-DTL-8783C)

Location

Loc Qty

Loc Code

LG

130

111210

31

114077

99

ml 10-07-20

MS21920-25

Purchased

No

230

Each

56.0000

2



Clamp(per MIL-DTL-8783C)

B114759

Location

Loc Qty

Loc Code

ST451

56

109181

25

113282

30

113744

1

8C 10-07-15

AN5-10A

Purchased

No

260

Each

139.0000

10



Bolt

Location

Loc Qty

Loc Code

ST337

139

114199

100

114227

39

ml 9752 54

ml 14199 54

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# Picklist Print

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Parent Item Name: Crosstube Aft

Comments: IPP Rev:C 05.09.02 Add holes for compatibility with Bell Skidtubes KJ/JLM  
IPP Rev:D Added Magnobond, Rubber Cushion & Clamps 07-02-19  
JLM

Start Date: 05/05/2010

Required Date: 21/05/2010

Start Qty: 1.00

Required Qty: 1.00

AN5-32A

Purchased

No

260

Each

212.0000

4



Bolt

Location

Loc Qty

Loc Code

ST340

212

113121

62

114056

100

114405

50

1114086

AN5-34A

Purchased

No

260

Each

116.0000

4



Bolt

Location

Loc Qty

Loc Code

ST340

116

113149

66

113226

50

113149

MS21042L5

Purchased

No

260

Each

695.0000

4



Nut

Location

Loc Qty

Loc Code

ST300

695

113523

26

113537

3

114108

164

114437

100

114449

400

16822

2

114813

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Item	QTY -245	PART NUMBER	DESCRIPTION
1	X	D407-667-245	CROSSTUBE ASSEMBLY (407 HIGH AFT)
2	1	D6011-115	CROSSTUBE
3	2	D2856-400-773	ABRASION STRIP
4	2	D2873-043	NUT PLATE
5	2	D2873-045	NUT PLATE
6	1	D2894-1	SUPPORT
7	2	D3190-1	CHAFING SHIELD
8	2	D3595-063-430	RUBBER CUSHION
9	14	MS20601AD4W8	RIVET (OR NAS9302B-4-8)
10	4	MS21920-22	CLAMP
11	2	MS21920-25	CLAMP (OR MS21920-24)
12	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947- 100, TYPE II, CLASS 2 ADHESIVE)

# **GENERAL NOTES:**

- MATERIAL: MANUFACTURED FROM D6011-115  
FINISHED LENGTH = 112.91±0.020
- FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1  
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2  
PAINT OUTSIDE PER DART QSI 005 4.2
- TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- UNITS: INCHES UNLESS OTHERWISE NOTED.
- BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- IDENTIFICATION: SCRIBE DART PART NUMBER "D407-667-245" AND BATCH NUMBER ON  
INSIDE OF CUFF USING VIBRATING STYLUS.
- WEIGHT: 27.7 lbs
- PART IS SYMMETRIC ABOUT CENTERLINE.
- RUN-OFF PART. BLEND OUT EDGE LONGITUDINALLY. TRANSITION SHOULD BE SMOOTH.
- BEND PROGRESSIVELY WITH A MINIMUM OF 6 PASSES. MAXIMUM TUBE FLATTENING DUE TO  
BENDING IS 6% BASED ON O.D.
- LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- INSTALL D2894-1 CENTER SUPPORT USING A 0.03" TO 0.06" THICK LAYER OF MAGNOBOND  
6398 PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO  
PACKAGING.
- INSTALL MS21920-25 CLAMPS WITH D3595-063-430 RUBBER CUSHIONS TO SECURE D2894-1  
SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE CROSSTUBE  
SUPPORT.  
NOTE: MS21920-24 CLAMPS CAN BE USED TO ACCOMMODATE VARYING DIAMETERS.  
ENSURE THERE IS A MINIMUM OF 1.5 THREADS IN SAFETY ON THE NUTS.
- EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE  
OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS  
SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT  
LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- INSTALL D2856-400-773 ABRASION STRIP WITH A 0.13 (REF) GAP ON BOTTOM SIDE OF  
CROSSTUBE, PER QSI 035.
- INSTALL D3190-1 CHAFING SHIELDS SO THAT OVERLAP IS ON BOTTOM SIDE OF CROSSTUBE  
OPPOSITE D2894-1 SUPPORT.
- TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS ARE SHOWING IN  
SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

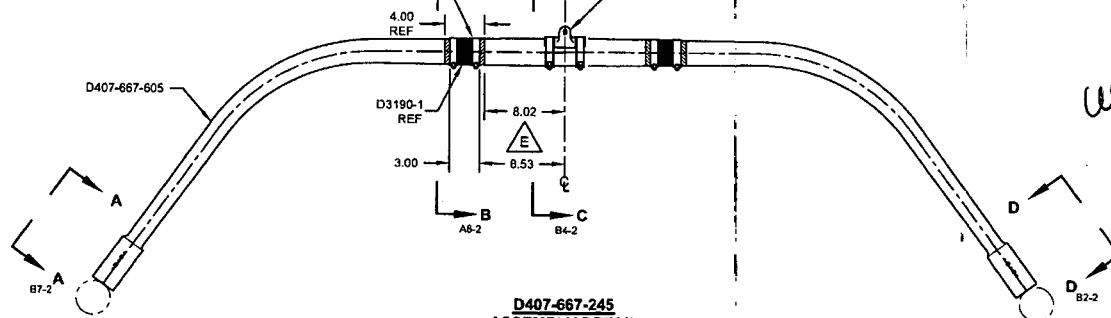
SHOP COPY  
RETURN TO  
ENGINEERING  
UNCONTROLLED COPY  
SUBJECT TO AMENDMENT  
WITHOUT NOTICE  
WORK ORDER  
NO. 58388  
B810-5-05

RELEASED  
08/11/06

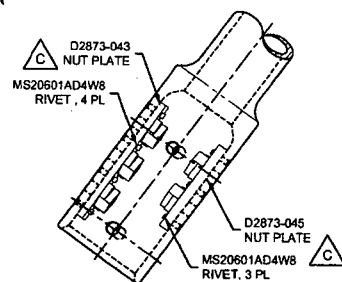
F	REFORMAT NOTES TO NEW STANDARDS (ZN B8-1); RELOCATED FLAG # 6 (ZN A8-3) PER NCR 210; REMOVED REF. & ADD TOLERANCES (ZN C6-3, C4-3 & D2-3)	RF	08.11.06
E	8.02 AND 8.53 WERE 8.40 AND 8.90 (ZN D5-2); REORGANIZED VIEWS AND REFORMATED DRAWING TO CURRENT STANDARDS. REASONS: CLAMPS MOVED 0.375 TOWARD CL TO ELIMINATE INTERFERENCE WITH AIRCRAFT MOUNTS. REFERENCE: PAR#08-21 AND ECN#1225	MB	08.07.24
D	ADD VIEW FOR OEM SKID HOLES, ROTATE ORIENTATION OF CLAMPS SECTION F-F, REMOVE -851 ABRASION STRIP, ADD MAGNOBOND 6398, ADD CUSHION	PH	07.02.07
C	ADD HOLES AND NUT PLATES FOR COMPATIBILITY WITH BHT/AA SKIDTUBES	PH	05.07.26
B	ADD CHAFING SHIELD	CP	03.05.21
A	NEW ISSUE	CP	02.05.13
REV.	DESCRIPTION	BY	DATE
DESIGN	RF	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	RF	DRAWING NO.	REV. F
MFG. APPR.	RF	D407-667-245	SHEET 1 OF 4
APPROVED	RF	TITLE	SCALE
DE APPR.	RF	CROSSTUBE ASS'Y (407 HIGH AFT)	NTS
DATE	08.11.06	COPYRIGHT © 2002 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSES OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

16 15 MS21920-22 CLAMP, 2 PL  
D2856-400-773 ABRASION STRIP  
D3190-1 CHAFING STRIP  
2 PL

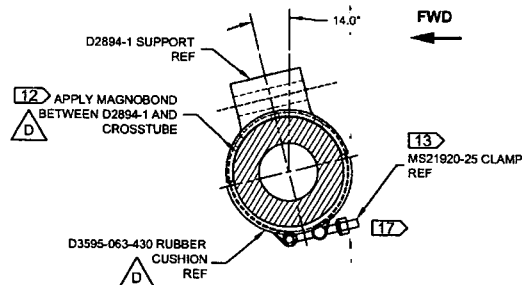
D2894-1 SUPPORT 12 13 17  
D3595-063-430 RUBBER CUSHION, 2 PL  
MS21920-25 CLAMP, 2 PL



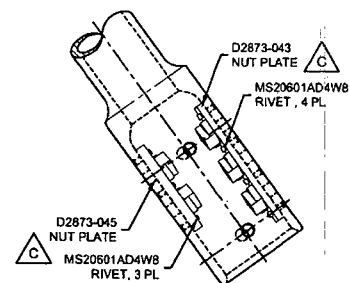
**D407-667-245**  
**ASSEMBLY DETAIL**  
(VIEW LOOKING FWD)



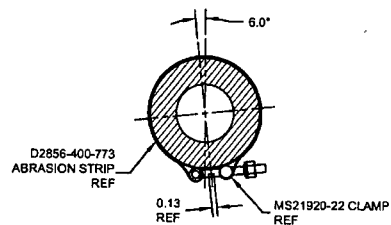
**VIEW A-A CUFF DETAIL**  
SCALE 4X



**SECTION C-C**  
SCALE 4X



**VIEW D-D CUFF DETAIL**  
SCALE 4X

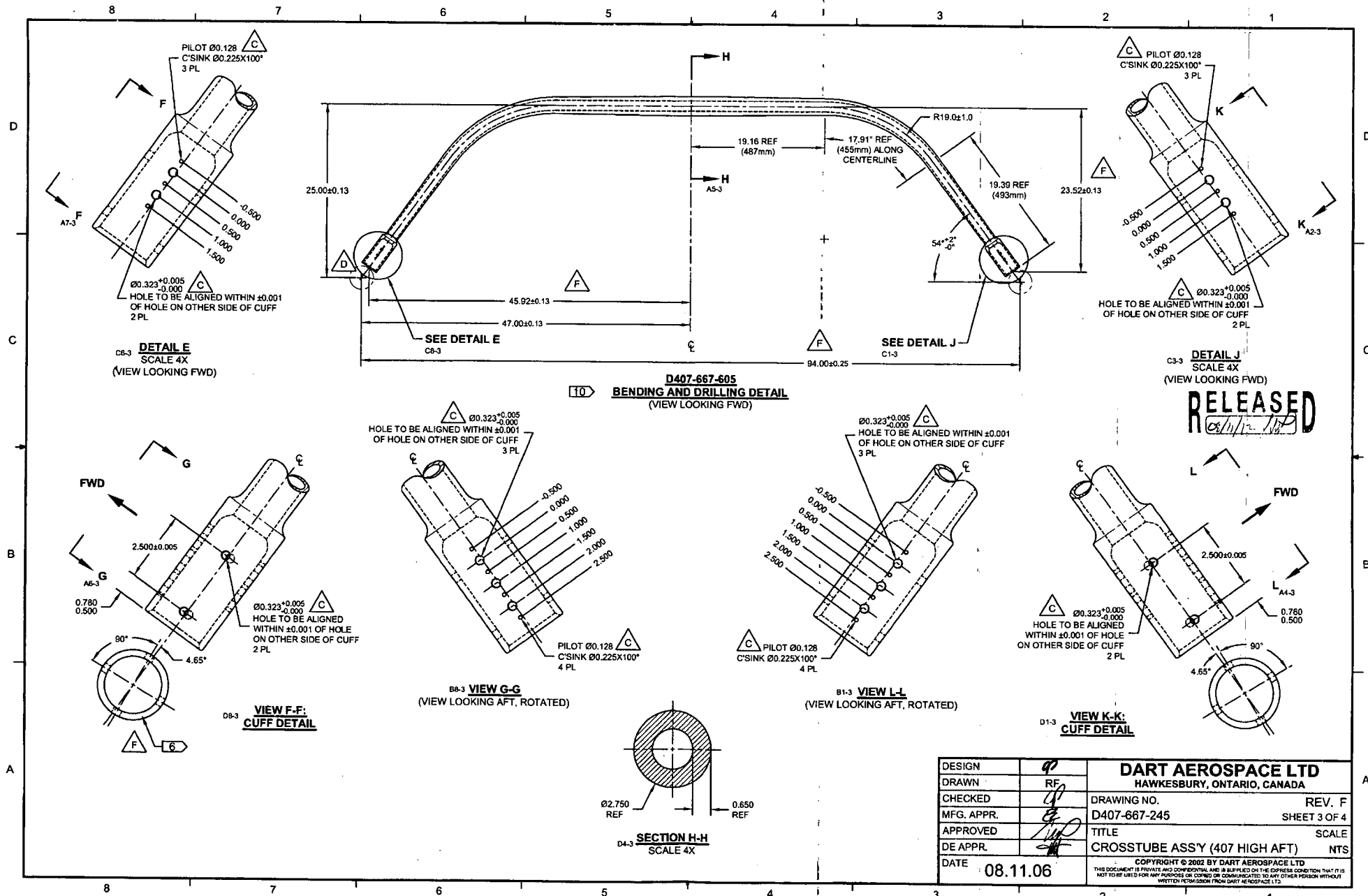


**SECTION B-B**  
SCALE 4X, 2PL

**RELEASED**  
08/11/06

DESIGN	9P	<b>DART AEROSPACE LTD</b>	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	UP	DRAWING NO.	REV. F
MFG. APPR.	EP	D407-667-245	SHEET 2 OF 4
APPROVED	14P	TITLE	SCALE
DE APPR.	14P	CROSSTUBE ASSY (407 HIGH AFT)	NTS
DATE	08.11.06	COPYRIGHT © 2002 BY DART AEROSPACE LTD	
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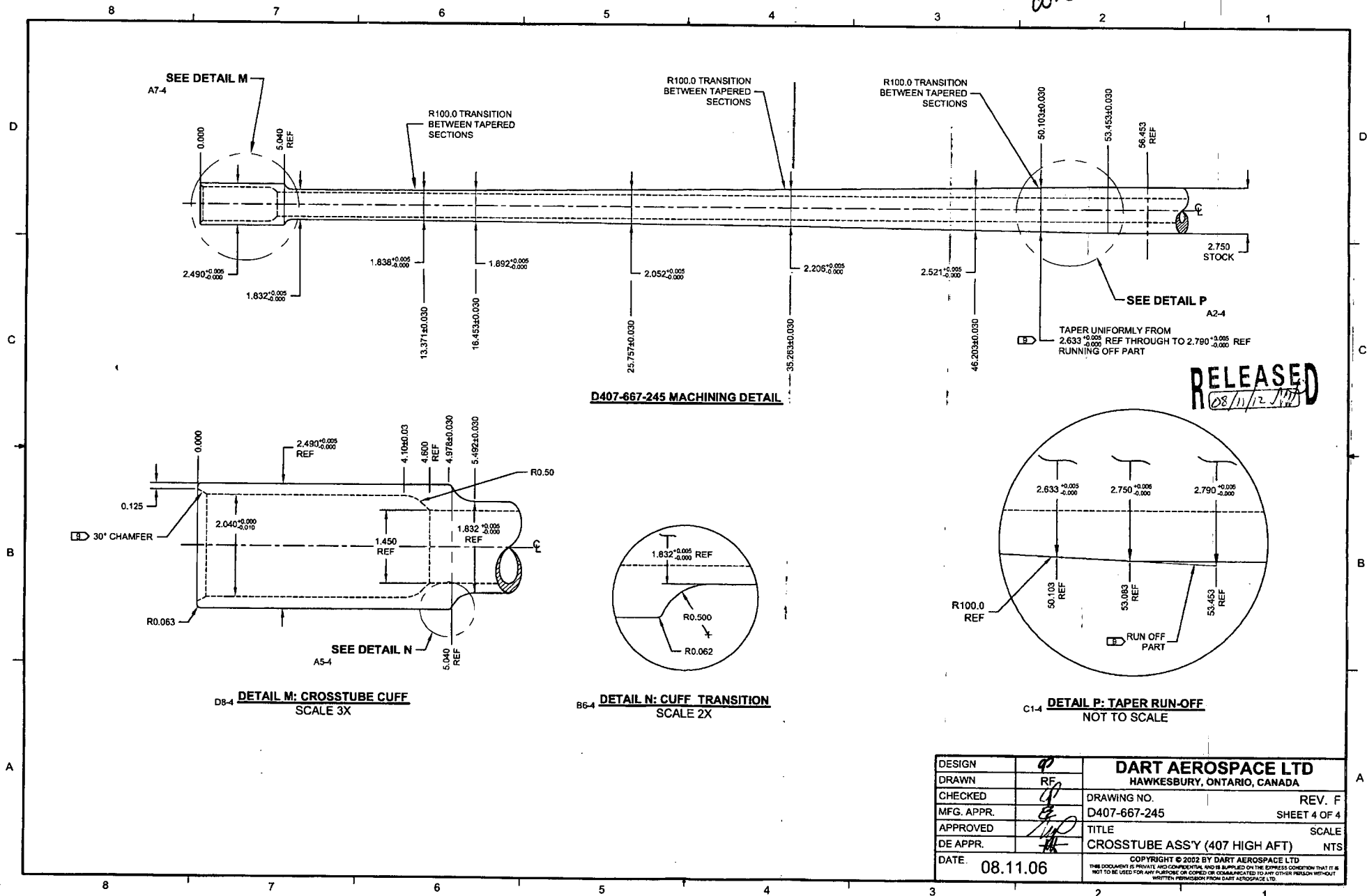
w/o 58388



DESIGN	90	<b>DART AEROSPACE LTD</b>	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	JP	DRAWING NO.	REV. F
MFG. APPR.	JP	D407-667-245	SHEET 3 OF 4
APPROVED	JP	TITLE	SCALE
DE APPR.	JP	CROSSTUBE ASS'Y (407 HIGH AFT)	NTS
DATE	08.11.06	<small>           COPYRIGHT © 2002 BY DART AEROSPACE LTD            THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS            NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT            WRITTEN PERMISSION FROM DART AEROSPACE LTD         </small>	

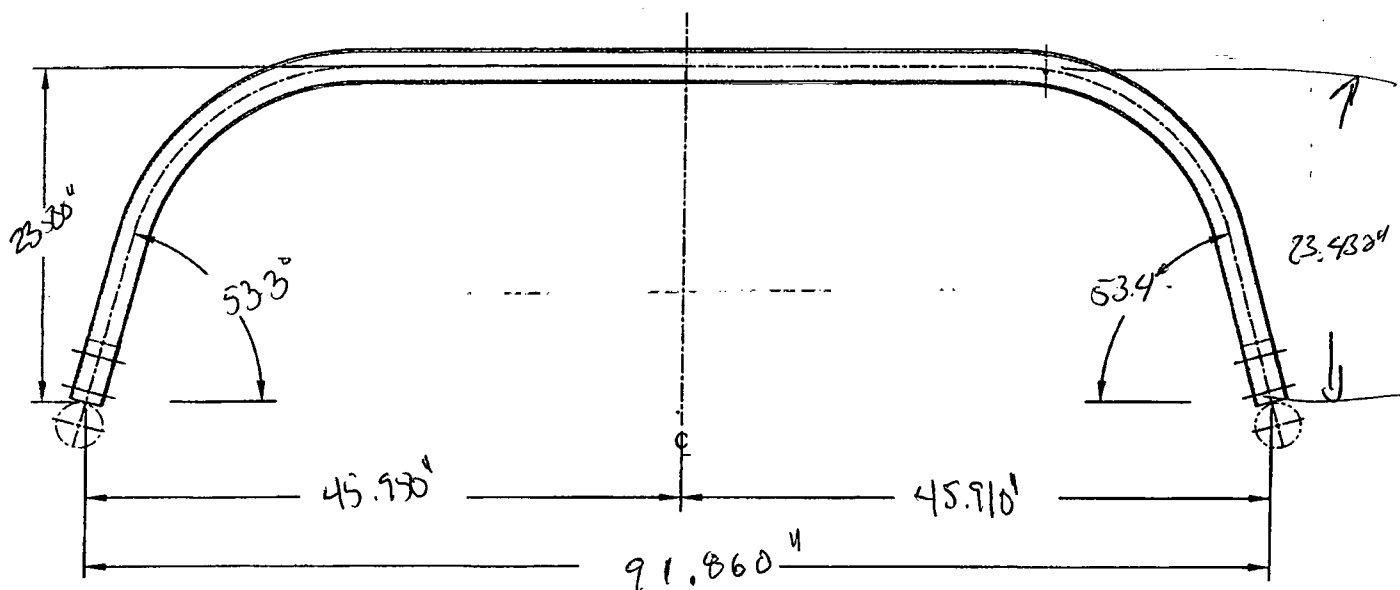


who 58388



<b>DART AEROSPACE LTD</b>	<b>Work Order:</b>	58396
<b>Description: Crosstube High Aft (407)</b>	<b>Part Number:</b>	D407-667-205
<b>Inspection Dwg: D407-667-245      Rev: F</b>		<b>Page 1 of 1</b>

Required Dimension	Min	Max
Height	23.46	23.58
1/2 Span	45.86	45.98
Angle	54	56
Total Span	91.72	91.96



Comments
OK of 10.06.24

QC15 Inspection	S
Date	10/06/24

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	09.06.22	Dwg Rev updated	KJ	



## LIQUID PENETRANT TEST REPORT

P- 15329

CLIENT	DART Aerospace	DATE	JULY 2-2010	PAGE	1	OF	1	
ATTENTION	LINDA / CHANTEL	ACUREN JOB No.	188-10-C776	TIME	AM	<input checked="" type="checkbox"/>	PM	<input type="checkbox"/>
ADDRESS	1276 ABERDEEN ST. HAWKESBURY, ON. K6H 1K7	PO/VO No.		WORK LOCATION	MAIN SHOP - HAWKESBURY			
PROJECT	F.P.I. on CROSS TUBES & MACHINED PARTS	ACCEPTANCE STD.	ASTM 1417	REV./DATE	2007			
ITEM(S) EXAMINED	FOUR CROSS TUBES ELEVEN MACHINED STUDS.							

JOB DESCRIPTION	PROCEDURE No. LT-0002	REV./DATE	TECHNIQUE No. LT-0002	REV./DATE		
PART No.			MATERIAL	S. STEEL	THICKNESS	ALUMINE -
SCOPE	WET FLOUORESCENT LIQUID PENETRANT INSPECTION CARRIED OUT 100% EXTERNAL.					ALUMINUM

TEST DETAILS								
METHOD	<input checked="" type="checkbox"/> FLUORESCENT	<input type="checkbox"/> VISIBLE	<input checked="" type="checkbox"/> WATER WASH	<input type="checkbox"/> SOLVENT REMOVABLE	<input type="checkbox"/> POST EMULSIFIED			
FAMILY BRAND	MAGNAFLUX		BLACK LIGHT S/N	16454	<input type="checkbox"/> OUTPUT > 1000 $\mu$ W/CM <sup>2</sup>	<input type="checkbox"/> AMBIENT < 2 fc		
PENETRANT	ZL 67	MINIMUM DWELL TIME	450	MIN.	LIGHTING EQUIP.	<input type="checkbox"/> FLASHLIGHT <input type="checkbox"/> TROUBLELIGHT <input type="checkbox"/> OUTPUT > 100 fc @ SURFACE		
PENETRANT REMOVER	H2O	MINIMUM DRY TIME	> 10	MIN.	OTHER	LABINO		
DEVELOPER	SKD 52	MINIMUM DWELL TIME	10	MIN.	LIGHT METER S/N	1098866	CAL DUE DATE	Oct. 19
DEVELOPER TYPE	<input checked="" type="checkbox"/> NON AQUEOUS	<input type="checkbox"/> AQUEOUS	<input type="checkbox"/> DRY					

TEST SURFACE					
SURFACE CONDITION	<input type="checkbox"/> AS GROUND	<input type="checkbox"/> AS WELDED	<input checked="" type="checkbox"/> MACHINED	<input type="checkbox"/> SHOT BLASTED	<input checked="" type="checkbox"/> CLEAN BARE METAL
SURFACE TEMPERATURE	<input type="checkbox"/> < -4°C/ 20°F	<input type="checkbox"/> -4°C/ 20°F TO 10°C/ 50°F	<input checked="" type="checkbox"/> 10°C/ 50°F TO 52°C/ 125°F	<input type="checkbox"/> > 52°C/ 125°F	

RESULTS-	<input type="checkbox"/> METRIC <input type="checkbox"/> IMPERIAL
6 - STUDS - W.O. 59668 ✓	
5 - STUDS - W.O. 58635 ✓	
1 - CROSS TUBE - W.O. 59975 ✓	
1 - CROSS TUBE - W.O. 59976 ✓	
1 - CROSS TUBE - W.O. 58387 ✓	
1 - CROSS TUBE - W.O. 58388 ✓	
INDICATIONS ON CROSS TUBES W.O. # 59975 W.O. # 59976 W.O. # 58388 IN PROCESS TO BE REMOVED	

**Scope of Services**  
The agreement of Acuren Group Inc. to perform services extends only to those services provided for in writing. Under no circumstances shall such services extend beyond the performance of the requested services. It is expressly understood that all descriptions, comments and expressions of opinion reflect the opinions or observations of Acuren Group Inc. based on information and assumptions supplied by the owner/operator and are not intended nor can they be construed as representations or warranties. Acuren Group Inc. is not assuming any responsibilities of the owner/operator and the owner/operator retains complete responsibility for the engineering, manufacture, repair and use decisions as a result of the data or other information provided by Acuren Group Inc. In no event shall Acuren Group Inc.'s liability in respect of the services referred to herein exceed the amount paid for such services.

**Standard of Care**  
In performing the services provided, Acuren Group Inc. uses the degree, care and skill ordinarily exercised under similar circumstances by others performing such services in the same or similar locality. No other warranty, expressed or implied, is made or intended by Acuren Group Inc.

SIGNATURES			
CLIENT REPRESENTATIVE	Jason Murdoch	DTR #	E63366
TECHNICIAN (SIGNATURE):	Mike Whitson	REPORT REVIEWED BY:	
NAME (PRINT):	Mike Whitson	NAME	INITIALS
CGSB LEVEL	2	SNT LEVEL	
CGSB REG. No	6606	CGSB LEVEL	
		SNT LEVEL	
		CGSB REG. No	



## LIQUID PENETRANT TEST REPORT

P- 15181

CLIENT	DART Aerospace	DATE	Jul 17 - 2010	PAGE	1	OF	1
ATTENTION	LINDA/CHANTEL	ACUREN JOB No.	100-10-0777	TIME	AM	<input checked="" type="checkbox"/>	PM <input type="checkbox"/>
ADDRESS	1270 ABERDEEN, HAWKESBURY ONT K0H 1K7	PO/VO No.		WORK LOCATION	MAINT SHOP - HAWKESBURY		
PROJECT	F.P.I. on THREE CROSS TUBES THAT HAD PREVIOUS	ACCEPTANCE STD.	ASTM 1417	REV./DATE	2007		
ITEM(S) EXAMINED	INDICATIONS (SEE REPORT # 15329) & FOUR CROSS TUBES						

JOB DESCRIPTION	PROCEDURE No. LT0002	REV./DATE		TECHNIQUE No. LT0002	REV./DATE	
PART No.		MATERIAL	STAINLESS STEEL	THICKNESS	ALUMINUM	
SCOPE	WET FLUORESCENT LIQUID PENETRANT ALUMINUM INSPECTION CARRIED OUT 100% EXTERNAL					

TEST DETAILS	
METHOD <input checked="" type="checkbox"/> FLUORESCENT <input type="checkbox"/> VISIBLE	<input checked="" type="checkbox"/> WATER WASH <input type="checkbox"/> SOLVENT REMOVABLE <input type="checkbox"/> POST EMULSIFIED
FAMILY BRAND MASNAFLUX	BLACK LIGHT S/N 16459 <input type="checkbox"/> OUTPUT > 1000 $\mu$ W/cm <sup>2</sup> <input type="checkbox"/> AMBIENT < 2 fc
PENETRANT ZL 67 MINIMUM DWELL TIME 45 MIN.	LIGHTING EQUIP. <input type="checkbox"/> FLASHLIGHT <input type="checkbox"/> TROUBLELIGHT <input type="checkbox"/> OUTPUT > 100 fc @ SURFACE
PENETRANT REMOVER H2O MINIMUM DRY TIME > 10 MIN.	OTHER LABINO
DEVELOPER SLD 52 MINIMUM DWELL TIME 10 MIN.	LIGHT METER S/N 1098866 CAL DUE DATE Oct 18 2010
DEVELOPER TYPE <input type="checkbox"/> NON AQUEOUS <input type="checkbox"/> AQUEOUS <input type="checkbox"/> DRY	

TEST SURFACE	
SURFACE CONDITION <input type="checkbox"/> AS GROUND <input type="checkbox"/> AS WELDED <input checked="" type="checkbox"/> MACHINED <input type="checkbox"/> SHOT BLASTED <input checked="" type="checkbox"/> CLEAN BARE METAL	
SURFACE TEMPERATURE <input type="checkbox"/> < -4°C/20°F <input type="checkbox"/> -4°C/20°F TO 10°C/50°F <input checked="" type="checkbox"/> 10°C/50°F TO 52°C/125°F <input type="checkbox"/> > 52°C/125°F	

RESULTS- <input type="checkbox"/> METRIC <input type="checkbox"/> IMPERIAL	
1 - Cross Tube W.O. 59975 ✓	NOTE: CROSS TUBES - W.O. 59975 - W.O. 59976 - W.O. 58388 WERE ON REPORT # 15329. INDICATIONS WERE LOCATED - AREAS OF INTEREST WERE EXAMINED AT THIS TIME AND FOUND ACCEPTABLE.
1 - Cross Tube W.O. 59976 ✓	
1 - Cross Tube W.O. 58388 ✓	
1 - Cross Tube W.O. 60145 ✓	
1 - Cross Tube W.O. 60146 ✓	
1 - Cross Tube W.O. 59973 ✓	

## Scope of Services

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## Standard of Care

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## SIGNATURES

CLIENT REPRESENTATIVE	Ken Titley	DTR #	EG3368
TECHNICIAN (SIGNATURE):	Mike Johnston	REPORT REVIEWED BY:	
NAME (PRINT):	Mike Johnston	NAME	INITIALS
CGSB LEVEL 2 SNT LEVEL	CGSB LEVEL SNT LEVEL		
CGSB REG. No 6606	CGSB REG. No		